

CLAIMS

1. An object sensing system, comprising:
an electric field sensing electrode arrangement (30), the electrode field
5 sensing electrode arrangement (30) comprising:
 - a first electrode arranged as an electric field sensing reception electrode (32),
 - a second electrode arranged as a first electric field sensing transmission electrode (34), and

10 a third electrode arranged as a second electric field sensing transmission electrode (36);
driving circuitry (6, 56) arranged to supply a first alternating voltage (120) to the first electric field sensing transmission electrode (34) and a second alternating voltage to the second electric field sensing transmission electrode (36), the second alternating voltage (130) comprising at least some antiphase portions compared to the first alternating voltage (120); and
15 sensing circuitry (8) arranged to process currents, induced in the electric field sensing reception electrode (32) by electric fields generated by the first and second electric field sensing transmission electrodes when driven
20 by the first and second alternating voltages respectively, to detect changes in the induced current due to an object (54) positioned in the electric fields.
2. A system according to claim 1, wherein the second alternating voltage (130) is an inverted form of the first alternating voltage (120).
- 25 3. A system according to claim 1 or 2, wherein the first and second electric field sensing transmission electrodes are substantially annular ring shaped, the first electric field sensing transmission electrode (34) being positioned substantially around the electric field sensing reception electrode (32), and the second electric field sensing transmission electrode (36) being positioned substantially around the first electric field sensing transmission electrode (34).

4. A system according to claim 1 or 2, wherein the electric field sensing reception electrode (32) is substantially a block shape, and the first and second electric field sensing transmission electrodes are substantially
5 annular shaped, the first electric field sensing transmission electrode (34) being positioned substantially around the electric field sensing reception electrode (32), and the second electric field sensing transmission electrode (36) being positioned substantially around the first electric field sensing transmission electrode (34).

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5. A system according to claim 1 or 2, wherein the electric field sensing reception electrode (32) is substantially a circle shape, and the first and second electric field sensing transmission electrodes are substantially annular ring shaped, the first electric field sensing transmission electrode (34)
15 being positioned substantially around the electric field sensing reception electrode (32), and the second electric field sensing transmission electrode (36) being positioned substantially around the first electric field sensing transmission electrode (34).

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6. A system according to any preceding claim, wherein the electrode field sensing electrode arrangement (30) further comprises one or more further electrodes arranged as further electric field sensing transmission electrodes.

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7. A system according to any preceding claim, wherein the system further comprises one or more further electric field sensing electrode arrangements, which along with the electric field sensing electrode arrangement (30) are arranged in a matrix, and corresponding sensing circuitry.

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8. A method of sensing objects, comprising:

providing an electric field sensing electrode arrangement (30), the electrode field sensing electrode arrangement (30) comprising:

a first electrode arranged as an electric field sensing reception electrode (32),

5 a second electrode arranged as a first electric field sensing transmission electrode (34), and

a third electrode arranged as a second electric field sensing transmission electrode (36);

supplying a first alternating voltage (120) to the first electric field
10 sensing transmission electrode (34) and a second alternating voltage to the second electric field sensing transmission electrode (36), the second alternating voltage (130) comprising at least some antiphase portions compared to the first alternating voltage (120); and

15 processing currents induced in the electric field sensing reception electrode (32) by electric fields generated by the first and second electric field sensing transmission electrodes when driven by the first and second alternating voltages respectively; and

detecting changes in the induced current due to an object (54) positioned in the electric fields.

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9. A method according to claim 8, wherein the second alternating voltage (130) is an inverted form of the first alternating voltage (120).

10. A method according to claim 8 or 9, wherein the first and second
25 electric field sensing transmission electrodes are substantially annular ring shaped, the first electric field sensing transmission electrode (34) being positioned substantially around the electric field sensing reception electrode (32), and the second electric field sensing transmission electrode (36) being positioned substantially around the first electric field sensing transmission electrode (34).

11. A method according to claim 8 or 9, wherein the electric field sensing reception electrode (32) is substantially a block shape, and the first and second electric field sensing transmission electrodes are substantially annular shaped, the first electric field sensing transmission electrode (34) being positioned substantially around the electric field sensing reception electrode (32), and the second electric field sensing transmission electrode (36) being positioned substantially around the first electric field sensing transmission electrode (34).
- 10 12. A method according to claim 8 or 9, wherein the electric field sensing reception electrode (32) is substantially a circle shape, and the first and second electric field sensing transmission electrodes are substantially annular ring shaped, the first electric field sensing transmission electrode (34) being positioned substantially around the electric field sensing reception electrode (32), and the second electric field sensing transmission electrode (36) being positioned substantially around the first electric field sensing transmission electrode (34).
- 20 13. A method according to any of claims 8 to 12, wherein the electrode field sensing electrode arrangement (30) further comprises one or more further electrodes arranged as further electric field sensing transmission electrodes.
- 25 14. A method according to any of claims 8 to 13, wherein the system further comprises one or more further electric field sensing electrode arrangements, which along with the electric field sensing electrode arrangement (30) are arranged in a matrix, and corresponding sensing circuitry.